

CLAIMS:

1. An ultrasonic transmitting and receiving apparatus comprising:

an ultrasonic probe including plural ultrasonic  
5 transducers;

plural transmitting circuits for respectively  
generating plural drive signals to be supplied to said  
ultrasonic probe so as to transmit an ultrasonic beam;

plural receiving circuits for respectively processing  
10 plural detection signals output from said ultrasonic probe  
which has received an ultrasonic echo;

switching means for selectively connecting a  
predetermined number of ultrasonic transducers in said plural  
ultrasonic transducers to said plural transmitting circuits  
15 and/or said plural receiving circuits; and

control means for controlling said switching means to  
change a sparse pattern of the ultrasonic transducers which  
transmit and/or receive ultrasonic waves.

2. An ultrasonic transmitting and receiving apparatus  
20 according to claim 1, wherein said control means controls  
said switching means in accordance with a steering range of  
the ultrasonic beam to be transmitted.

3. An ultrasonic transmitting and receiving apparatus  
according to claim 2, further comprising rewritable storing  
25 means for storing information representing plural sparse  
patterns of said predetermined number of ultrasonic  
transducers which transmit and/or receive ultrasonic waves

in accordance with a steering range of the ultrasonic beam to be transmitted.

4. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein said switching means is disposed  
5 in an ultrasonic transmitting and receiving apparatus main body.

5. An ultrasonic transmitting and receiving apparatus according to claim 2, wherein said switching means is disposed in an ultrasonic transmitting and receiving apparatus main  
10 body.

6. An ultrasonic transmitting and receiving apparatus according to claim 3, wherein said switching means is disposed in an ultrasonic transmitting and receiving apparatus main body.

15 7. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein said control means controls said switching means to partially change the sparse pattern of the ultrasonic transducers which transmit and/or receive ultrasonic waves.

20 8. An ultrasonic transmitting and receiving apparatus according to claim 2, wherein said control means controls said switching means to partially change the sparse pattern of the ultrasonic transducers which transmit and/or receive ultrasonic waves.

25 9. An ultrasonic transmitting and receiving apparatus according to claim 3, wherein said control means controls said switching means to partially change the sparse pattern

of the ultrasonic transducers which transmit and/or receive ultrasonic waves.

10. An ultrasonic transmitting and receiving method comprising the steps of:

5       (a) selecting a predetermined number of ultrasonic transducers from among plural ultrasonic transducers included in an ultrasonic probe to determine a sparse pattern of the ultrasonic transducers which transmit and/or receive ultrasonic waves; and

10       (b) transmitting an ultrasonic beam and/or receiving an ultrasonic echo by using the predetermined number of ultrasonic transducers selected at step (a).

11. An ultrasonic transmitting and receiving method comprising the steps of:

15       (a) changing a sparse pattern of ultrasonic transducers, which transmit and/or receive ultrasonic waves, in accordance with a steering range of an ultrasonic beam; and

      (b) transmitting an ultrasonic beam and/or receiving an ultrasonic echo in accordance with the sparse pattern  
20   changed at step (a).